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NP-33-04-002-00

Docket No. 50-346

License No. NPF-3

October 4, 2004

United States Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555-0001

Ladies and Gentlemen:

LER 2004-002-00
Davis-Besse Nuclear Power Station, Unit No. 1
Date of Occurrence – August 4, 2004

Enclosed please find Licensee Event Report 2004-002-00, which is being submitted to provide written notification of an unplanned reactor trip during Reactor Trip Breaker Testing. This trip occurred due to the presence of a failed fuse in Reactor Trip Breaker "A" circuitry, such that when Reactor Trip Breaker "B" was opened per the test procedure, Reactor Trip Breaker "A" also opened, tripping the reactor. This event is being reported pursuant to 10 CFR 50.73(a)(2)(iv)(A), an event that resulted in actuation of the Reactor Protection System. A 4-hour immediate notification of this event was made to the NRC on August 4, 2004 (Event No. 40921). Commitments associated with this LER are listed in the Attachment.

Very truly yours,

GMW

Enclosure
Attachment

cc: Regional Administrator, USNRC Region III
DB-1 Senior Project Manager, USNRC
DB-1 NRC Senior Resident Inspector
Utility Radiological Safety Board

IE22

COMMITMENT LIST

The following list identifies those actions committed to by the Davis-Besse Nuclear Power Station in this document. Any other actions discussed in the submittal represent intended or planned actions by Davis-Besse. They are described only as information and are not regulatory commitments. Please notify the Director – Performance Improvement (419-321-7181) at Davis-Besse of any questions regarding this document or associated regulatory commitments.

	COMMITMENTS	DUE DATE
1.	The Surveillance Test procedures that perform the Channel Functional Test of all four Reactor Trip Breakers were revised to require verification of fuse indication prior to performing the test.	1. Completed August 17, 2004
2.	Additional procedures that may open the Reactor Trip Breakers will be identified and revised as applicable to require verification of acceptable fuse status prior to opening the Reactor Trip Breakers.	2. December 5, 2004
3.	Preventive maintenance activities will be developed to replace the fuses associated with the Control Rod Drive System Source Interruption Devices on a periodic basis to preclude failure due to age and/or weakening due to long term cycling.	3. November 15, 2004

NRC FORM 366 (6-2004) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 6/30/2007

Estimated burden per response to comply with this mandatory collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet e-mail to Infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

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4. TITLE

Reactor Trip During Reactor Trip Breaker Testing Due To Fuse Failure

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
08	04	2004	2004	- 002	- 00	10	04	2004		05000
									FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE

1

10. POWER LEVEL

100

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*

- ☐ 20.2201(b)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☐ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(a)
- ☐ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☒ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☐ 50.73(a)(2)(v)(D)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER *(Include Area Code)*
Gerald M. Wolf, Staff Engineer, Regulatory Compliance	(419) 321-8001

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
X	JC	FU	G080	Y					

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES *(If yes, complete EXPECTED SUBMISSION DATE).* ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On August 4, 2004, at 1023 hours with the plant at approximately 100 percent power, surveillance testing was in progress on the Reactor Trip Breakers. When Reactor Trip Breaker "B" was opened in accordance with the test procedure, a reactor trip occurred unexpectedly due to the simultaneous opening of the Reactor Trip Breaker "A." Reactor Trip Breaker "A" opened due to a fuse that had failed prior to the test in a circuit designed to open the breaker when an undervoltage condition is detected. When Reactor Trip Breaker "B" was opened in accordance with the test procedure, both inputs to the Source Interruption Device indicated an undervoltage condition, initiating a trip of Reactor Trip Breaker "A" and a subsequent trip of the reactor. No procedural check existed to check the status of the existing failed fuse indicator lights prior to simulating a trip of the Reactor Trip breakers. The fuse was determined to have failed due to age and fatigue. The failed fuse along with the other three similar fuses in the Reactor Trip Breaker circuitry were replaced, and the four Reactor Trip Breaker Surveillance Tests were revised to require verification of fuse indication prior to performing the test. This event is being reported in accordance with the 10CFR50.73(a)(2)(iv)(A) as an event that resulted in actuation of the Reactor Protection System.

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17. NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)*

DESCRIPTION OF OCCURRENCE:

On August 4, 2004, with the plant in Mode 1 operating at approximately 100 percent power, quarterly surveillance testing was in progress on the Reactor Trip Breakers and Reactor Protection System (RPS) [JC] utilizing procedure DB-MI-03011, "Channel Functional Test of Reactor Trip Breaker B, RPS Channel 1 Reactor Trip Module Logic and ARTS Channel 1 Output Logic." In accordance with the surveillance test procedure, technicians placed Reactor Trip Module (RTM) Reactor Protective Channel Switches A and B to the "SIMULATE TRIP" position. When the second switch was placed in the "SIMULATE TRIP" position, a reactor trip occurred at 1023 hours.

Unit response to the reactor trip was as designed. Plant parameters stabilized within their normal post-trip values. One Main Steam Safety Valve (MSSV) [SB-RV], SP17A9 continued to lift following the reactor trip at a value less than its setpoint of 1100 psig. Operators lowered Steam Generator 2 pressure to approximately 970 psig in order to allow SP17A9 to reseat.

Initial notification of this automatic reactor trip was made to the NRC at 1114 hours on August 4, 2004, in accordance with the four-hour reporting requirement of 10CFR50.72(b)(2)(iv)(B) (Event Number 40921). This report is being submitted in accordance with the 10CFR50.73(a)(2)(iv)(A) as an event that resulted in actuation of the Reactor Protection System.

APPARENT CAUSE OF OCCURRENCE:

Electric power to the Control Rod Drives (CRDs) and Motors [AA] is supplied by redundant power channels, and the Reactor Trip Breakers are arranged such that breaker "A" or "C" AND "B" or "D" must be open to remove power from the CRDs. When Reactor Trip Breaker "B" was opened as part of the surveillance test, Reactor Trip Breaker "A" also opened unexpectedly removing power to the CRDs allowing the Control Rods to insert into the Reactor Core.

Reactor Trip Breaker "A" opened due to a fuse failure in a circuit designed to open the breaker when an undervoltage condition is detected on either redundant CRD System power channel. The circuit, part of the Source Interruption Device (SID) installed in both Reactor Trip Breakers "A" and "B", receives undervoltage detection input from both redundant CRD power channels. Refer to Figure 1 for a simplified functional diagram of the CRD circuitry. The fuse in the Reactor Trip Breaker "A" power channel undervoltage detection input that receives power from Reactor Trip Breakers "A" and "C" had failed prior to the test, leaving the Reactor Trip Breaker "A" Source Interruption Device in a half-tripped condition. When Reactor Trip Breaker "B" was opened as intended during the test, input from Reactor Trip Breaker "B" supplied power channel into the Reactor Trip Breaker "A" Source Interruption Device also depowered, indicating an undervoltage condition. With both inputs indicating an undervoltage condition, the Source Interruption Device responded as designed, initiating a shunt trip of Reactor Trip Breaker "A", which resulted in a trip of the reactor due to the depowering of the remaining CRD power source.

While the Reactor Trip Breaker Source Interruption Device fuses are equipped with failed fuse indicator lights that can be observed when the Reactor Trip Breaker cubicle is opened, surveillance test procedure DB-MI-03011 contained no procedural check to determine the status of these fuses prior to test performance. The fuse in Reactor Trip Breaker "A" Source Interruption Device was determined to have failed due to age and fatigue.

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17. NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)*

ANALYSIS OF OCCURRENCE:

There were no safety concerns identified during or as a result of this event. When the Control Rod Drive Trip Breakers opened, all Control Rods inserted. The Steam Generator outlet pressure increased due to the closing of the Main Turbine Stop Valves [TA-ISV]. The Turbine Bypass Valves (TBVs) [SB-PCV] and the Atmospheric Vent Valves (AVVs) [SB-PCV] opened and the MSSVs lifted in response to the increasing secondary system pressure. The MSSVs (except for SP17A9 as described above) and the AVVs closed as Steam Generator outlet pressure decreased. The Safety Features Actuation System [JE] was not challenged during this event, and there were no significant deviations in Reactor Coolant System pressure, temperature, or inventory control; or in Steam Generator pressure or inventory control.

CORRECTIVE ACTIONS:

The failed fuse in Reactor Trip Breaker "A" was replaced, along with the remaining fuses associated with the Source Interruption Device supply circuits as a preventative measure for age/weakening.

The Surveillance Test procedures that perform the Channel Functional Test of all four Reactor Trip Breakers were revised to require verification of fuse indication prior to performing the test. Additional procedures that may open the Reactor Trip Breakers will be identified and revised as applicable by December 5, 2004, to require verification of acceptable fuse status prior to opening the Reactor Trip Breakers.

Preventive maintenance activities will be developed by November 15, 2004, to replace the fuses associated with the Control Rod Drive System Source Interruption Devices on a periodic basis to preclude failure due to age and/or weakening due to long term cycling.

FAILURE DATA:

There have been no Licensee Event Reports at the Davis-Besse Nuclear Power Station involving a reactor trip caused by a fuse failure in the previous three years. While the discovery of failed open fuses is a relatively common event, there has been no actuation of engineered safety feature equipment at the Davis-Besse Nuclear Power Station as a result of a failed fuse in the past three years.

Energy Industry Identification System (EIIS) codes are identified in the text as [XX].

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17. NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)*

FIGURE 1

Simplified Functional Diagram of the CRD Circuitry